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DEVELOPMENT AND INTERNATIONAL ECONOMIC COOPERATION: FOOD AND AGRICULTURAL DEVELOPMENT

Screw-worm eradication programme

Note by the Secretary-General

The Secretary-General has the honour to transmit to the members of the Council, as an annex to the present note, the report of the Director-General of the Food and Agriculture Organization of the United Nations (FAO), prepared in cooperation with the International Fund for Agricultural Development (IFAD), on the screw-worm infestation in North Africa and efforts undertaken to eradicate it, prepared in accordance with Economic and Social Council resolution 1991/59.

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ANNEX

SCREW-WORM ERADICATION PROGRAMME

Report of the Director-General of the Food and Agriculture Organization of the United Nations

SUMMARY

The New World screw-worm (Cochliomyia hominivorax Coquerel) was first detected in the Libyan Arab Jamahiriya in 1988. This was its first occurrence outside the Americas, where it is considered one of the most damaging pests to livestock. The infestation spread, despite control measures adopted at the time, to an area of 25,000 km^2 in the north-west of the country. By 1990, more than 12,000 infected animals were detected in the zone.

Early in 1989, the Libyan authorities contacted the International Atomic Energy Agency (IAEA), FAO, IFAD and the United Nations Development Programme (UNDP) to seek assistance in addressing the newly introduced pest problem. FAO arranged a mission, with the British Museum and IFAD, to confirm its existence, alert all countries considered at risk and determine the immediate action required to contain both the disease and the vector.

A comprehensive programme of animal inspection and treatment was established by the Libyan Government. This helped contain the infestation, confine it to the Tripoli area and control the incidence of the disease in livestock and human beings. This was followed by the implementation of national and regional projects to support training, surveys, surveillance, identification, animal treatment and public awareness campaigns.

It was apparent from the earliest investigations that eradication could not be achieved by animal inspection and treatment alone. However, the same pest had been successfully controlled in the United States of America and Mexico through the use of the sterile insect technique (SIT). This technique was field tested in a US$ 2.8 million pilot programme, approved for funding by the Executive Board of IFAD in December 1989, with co-financing by the African Development Bank, UNDP and FAO. The latter also implemented the pilot programme pursuant to an agreement signed with IFAD and a project document signed by the Government, IFAD and FAO. The Director-General of FAO established the Screw-worm Emergency Centre for North Africa (SECNA) at FAO headquarters, Rome, to implement the eradication programme.

SIT operations were extended to the entire infested area in early February 1991. The number of screw-worm myiasis cases dropped from over 12,000 in 1990 to 6 in 1991, the last being detected on 7 April 1991. Following six months of continued dispersal of millions of sterile flies, the SIT operation was suspended on 15 October 1991.

In terms of institutional lessons learned, this successful campaign demonstrated that cooperation among technical agencies, financing institutions, bilateral agencies, non-governmental organizations and the affected countries could effectively address a disaster situation, in a coordinated manner, and successfully avert its potentially detrimental impact.

Introduction

1. The New World screw-worm (Cochliomyia hominivorax Coquerel) was first detected in the Libyan Arab Jamahiriya in 1988. When suspecting farmers contacted the Parasitology Department of the School of Veterinary Medicine, University of Tripoli, the Libyan scientists classified the specimens and sent them to the CAB International Institute of Entomology, which suggested in January 1989 that the larval samples were from New World screw-worm infested wounds. This was its first occurrence outside the Americas, where it is one of the most damaging pests to livestock. The infestation spread, despite control measures employed, initially, to an area of 25,000 km^2 in the north-west of the country. By 1990, more than 12,000 infested animals were detected in the zone.

Preparatory phase

2. Early in 1989, the Libyan authorities contacted IAEA, FAO, IFAD and UNDP. FAO arranged a mission, which included representatives from the British Museum and IFAD, to confirm its existence, alerting all countries considered at risk. The mission also served to determine the immediate action required to contain the disease. Meanwhile, a comprehensive programme of animal inspection and treatment was established by the Libyan Government, with FAO and UNDP financial assistance. These activities helped contain the infestation, confine it to the Tripoli area and control the incidence of the disease in livestock and humans. National and regional projects funded by FAO, in the amount of US$ 2.4 million, supported training, surveys, surveillance, identification, animal treatment and public awareness campaigns.

3. At the initiative of the joint FAO/IAEA division, an action group was established in Rome in April 1989 to consider effective ways and means of combating the serious livestock pest. It subsequently became the FAO/IFAD/IAEA/UNDP/Libya Screw-worm Action Group, which played an active role in defining the content of the screw-worm eradication campaign that followed. The Director-General established the Screw-worm Emergency Centre for North Africa at FAO headquarters, Rome, in June 1990, to implement the eradication programme.

Pilot programme

4. It was apparent to the Action Group from the earliest investigations that eradication could not be achieved solely by animal inspection and treatment. However, the same pest had been successfully controlled in the United States of America and Mexico through the use of the sterile insect technique. Close cooperation was therefore established with the Governments of the United States and Mexico and their Joint Commission for the Eradication of Screw-worm.

5. The elements for an eradication programme, prepared by the joint FAO-IAEA division and reviewed by the Action Group, provided the basis for IFAD to prepare a pilot programme to test the feasibility of using this technique. After discussion with the Government and UNDP, a US$ 2.8 million pilot

programme was approved by the Executive Board of IFAD in December 1989 for co-financing with the African Development Bank, UNDP and FAO. Pursuant to an agreement signed between IFAD and FAO in May 1990, execution was entrusted to FAO. Accordingly, in June 1990 the Government, IFAD and FAO signed the document for project execution by FAO. The objectives of the pilot programme were to test the feasibility of transferring this technology and the logistical inputs required to the North African situation and to form the basis for the development of an eradication programme.

6. During the SIT component of the pilot programme (16 December 1990 to 14 February 1991), eight weekly shipments of sterile screw-worm pupae (3.5 to 7.0 million sterile insects per week) were transported from Mexico to the Libyan Arab Jamahiriya and the flies dispersed over a trial area of high infestation (6,600 km^2). The number of New World screw-worm cases reached over 12,000 in 1990, with a peak of slightly under 3,000 in September 1990. As had been the case in 1990, the number of cases dropped substantially during the winter months of 1991. Treatment of the entire infested area began in early February 1991. Only three animal cases were reported in January, two cases in February, none in March, and one case in April. During the same period, the number of trapped fertile flies was 34, with the last fertile fly being trapped on 27 April. The distribution of animal cases, confirmed by the trapping data on wild flies, indicated that the surviving population was widely dispersed throughout the infested area (25,000 km^2) during the spring of 1991.

7. Activities under the pilot programme included infrastructure development for the efficient transatlantic transfer of sterile flies from Mexico to the Libyan Arab Jamahiriya, establishment of handling and holding facilities in Tripoli and aerial release over the infested area. Essential quality control measures were established for analysis of various SIT parameters and facilities for weekly monitoring of flies put in place. A large number of surveillance teams were established for animal inspection and reporting of myiasis cases. A comprehensive information campaign was launched in the field, utilizing the media to promote public awareness not only in the Libyan Arab Jamahiriya but also in the neighbouring countries considered at the time to be at immediate risk of infestation. This campaign was highly effective in sensitizing the beneficiaries - farmers and livestock owners - and elicited their participation and cooperation in the project activities.

8. The pilot programme was highly successful in achieving its objectives and paved the way for the execution of the full-scale eradication programme.

The large-scale programme

(a) Planning and mobilization of resources

9. In preparation for a full-scale eradication programmme, a joint FAO-IAEA Working Group was established in January 1990 and a formulation mission led by FAO visited the country in late May-early June 1990. Libyan representatives, as well as representatives of IFAD, UNDP and IAEA, formed part of the team.

Even as the pilot programme got under way in July 1990, the FAO/IFAD/IAEA/UNDP/ Libya Screw-worm Action Group had initiated preparations for a large-scale intervention involving the shipment and release of up to 40 million sterile flies per week in the broader infested area of 25,000 km^2. This entailed the need for mobilizing additional financial resources commensurate with the task at hand.

10. IFAD played a major role in mobilizing these financial resources. FAO and IFAD held donor consultations, following which they co-sponsored two major pledging conferences in July 1990 and February 1991 at IFAD headquarters. The donor community responded generously. Funds in the amount of approximately US$ 35.4 million were pledged to the campaign for the first year of what was expected to be a two-year programme.

(b) Large-scale programme implementation

11. The large-scale eradication programme began in early February 1991, initially overlapping with the pilot programme. It covered the entire infested area (25,000 km^2). From 3 May 1991, the dispersal area was extended to 40,000 km^2 to include a buffer zone (of which 2,500 km^2 were within the Tunisian border). The number of sterile flies dispersed each week was increased to 40 million. The last positive myiasis case was detected on 7 April 1991 and the last fertile flies were collected on 27 April 1991.

12. An independent technical advisory committee, whose members were drawn from Mexico, the Netherlands and the United States of America, visited the area twice, from 5 to 10 May and from 31 August to 6 September 1991, and their recommendations were taken into account in implementing the eradication programme activities.

13. Following the advice of the technical advisory committee, and in agreement with the experience gained in the Mexican eradication programme, the distribution of sterile flies was suspended from 15 October 1991, that is, after nine life cycles free of New World screw-worm. The last remaining international staff left the Libyan Arab Jamahiriya in June 1992. Subsequent field operations will be limited to surveillance activities carried out by the Libyan authorities for a further year. The financial closure of the programme is expected in 1993.

14. SECNA continues an active role as the Libyan authorities concerned prepare to make the official announcement of the eradication of the New World screw-worm from North Africa. The final stage of the programme aims to reduce the risk of further outbreaks of screw-worm infestation. It includes strengthening the capacity of veterinary services in the North African countries. Important lessons are being drawn from the programme to reduce the risk of screw-worm spreading from its endemic areas in the Americas. The achievements, once consolidated, will be important in leading to reducing the risks of infestation and increasing the effectiveness of any subsequent eradication programme using sterile insects.

Research

15. During the programme, several areas for further research and development support were identified. The responsibility for coordination of these activities was delegated to the joint FAO-IAEA division, Vienna, with the assistance of the British Natural History Museum (United Kingdom), the Commonwealth Scientific and Industrial Research Organization (Australia), the United States Department of Agriculture and the Mexico-United States Commission for the Eradication of Screw-worm. The priority areas for research will continue to receive attention within the context of the preventative phase of the programme.

Costs and benefits

16. The eradication programme prepared by FAO in collaboration with IFAD was expected to take two years, and included three budget scenarios requiring international funds of US$ 62.7 million to US$ 91.5 million, in addition to a US$ 27 million contribution from the Government of the Libyan Arab Jamahiriya.

17. Several budgetary revisions were made during the course of the campaign. The original estimate of a requirement of international funds for completion of the programme was thus revised downward to a final estimate of US$ 34 million. The downward revisions were made in response to the rapid success that was being achieved. To date, a total of US$ 32.4 million has been delivered by donors, and a further US$ 2.9 million is expected (see table). With the delivery of all pledges, the required funding for the completion of the programme will be assured.

18. An independent study of the costs and benefits to the programme was commissioned. Using conservative estimates of the benefits at international prices, the gains from the programme (derived in the context of avoidance of potentially high losses in livestock numbers, reduction in the debilitating impact of the New World screw-worm on the livestock population in the infested area and the reduced need for continued treatment of infected animals) were shown to be at least 1.5 times larger than the cost of the programme. Once the benefits of protection throughout the Libyan Arab Jamahiriya were considered, the benefit-to-cost ratio was 3 to 1 and this increased to 50 to 1 when the benefits of protection derived by the surrounding countries were taken into account.

New World Screw-worm Eradication Programme, source of multidonor funds

(In United States dollars)

Source of funds	Payments to date	Expected
Governments		
Australia	232 558	
Austria	755 497	85 000
Belgium	1 000 000	
Finland	761 852	
France	2 000 000	
Germany	3 639 000	
Ireland	100 000	100 000
Italy	894 784	
Luxembourg	143 300	
Netherlands	2 045 824	
Spain	160 000	
Sweden	2 287 082	
United Kingdom	1 884 550	
United States of America a/	6 000 000	
Institutions		
AfDB	2 000 000	2 000 000
EC b/	2 466 583	
IFAD	3 327 985	672 015
IsDB c/	2 458 109	
OPEC Fund	200 000	
WWF	10 000	
Total	32 367 122	2 857 015

a/ Additional $1 million allocated for activities in Egypt.

b/ Additional $1.1 million allocated for activities in Egypt, $1.1 million for Tunisia and $438,000 for Algeria.

c/ Additional $1 million contributed directly to the Libyan Arab Jamahiriya and $1.5 million disbursed equally among the neighbouring countries: Algeria, Chad, Egypt, Niger, Morocco, Sudan and Tunisia.

Conclusion

19. The undetected transfer of the screw-worm from the American continent to North Africa serves to illustrate the vigilance required by both importing and exporting countries and the need for technically coordinated international cooperation if the introduction of exotic pests and their devastating consequences are to be avoided in the future.

20. The campaign was an example of effective cooperation among a large number of partners in an emergency operation: four United Nations bodies (FAO, IFAD, IAEA and UNDP); 14 donor countries (Australia, Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Spain, Sweden, United Kingdom, United States of America); three international financial institutions (Islamic Development Bank, African Development Bank and Organization of Petroleum Exporting Countries (OPEC) Fund), one regional integration organization (European Economic Community (EEC)), an international non-governmental organization (World Wide Fund for Nature (WWF)) and the African countries considered at risk. Special mention should be made of the significant contribution and the full cooperation of the most affected country, the Libyan Arab Jamahiriya.

21. In terms of institutional lessons learned, this successful campaign demonstrated that cooperation among technical agencies, financing institutions, bilateral agencies, non-governmental organizations and the affected countries could effectively address a disaster situation, in a coordinated manner, and successfully avert its potentially detrimental impact.